decrease in size of the canines, and a development of an arched form of the lower jaws. He complains that many paleontologists have not appreciated the law of increase in size as a fundamental one in evolution, but, if the mammalologists have not appreciated it, surely other paleontologists have.

As regards the relationships between the South American and the Old World and North American mammalian faunas he says: "While the other orders are already represented in the South American *Notostylops* fauna, we have to deal, especially in the rodents and primates, with new faunal elements which must have gone thither either in the Oligocene or at the beginning of the Miocene. And they could have gone only from Europe or northern Africa, since, as we have seen, these rodents are closely related to the European forms, and the primates have at least a closer relationship with those of the Fayum than with those of the North American Eocene. There must, therefore, have been a connection between South America and the Old World in the Oligocene or at the beginning of the Miocene." This theory has already been urged by Ameghino. "This connection could not have been a broad land bridge, otherwise there would have been an exchange of the larger mammals, which did not occur till the Pliocene." He suggests that this migration of the smaller animals may have occurred from island to island of an archipelago, the creatures possibly carried by the larger birds of prey. And he thinks also that about the same time there was a like exchange of the smaller mammals between North America and Africa.

S. W. W.

The Cid Mining District of Davidson County, North Carolina. By JOSEPH E. POGUE. Raleigh: *Bull. No. 22 North Carolina Geol. Survey*, 1910. Pp. 144; Plates 22.

This district is located in the central portion of the Piedmont Plateau and includes areas of slate, tuffs, volcanic breccia, rhyolite, dacite, and andesite, cut by gabbro and diabase dikes. All but the dike rocks range from a massive to a schistose condition with sericite and greenstone schists as the final product of dynamic metamorphism. The slates are interbedded with rhyolitic and dacitic tuffs. The coarser acid volcanic breccia grades into rhyolite flows and is thought to be a flow breccia. The gabbro dikes are approximately parallel to the schistosity and are cut by diabase dikes, said to be Triassic. The evidence as to the Triassic

age of the latter is inconclusive as it rests on the fact that they cut Triassic sandstones. On this evidence they might be post-Triassic.

The region comprises a series of folds, beveled to the present surface, and one great overthrust fault. The jointing, folding, faulting, and schistosity are referred to the same epoch of compression.

Four types of ore bodies are noted, namely impregnations in the schists, stringer leads in quartz, parallel to the schistosity, quartz veins cutting the schistosity, and replacement deposits.

The ore minerals are auriferous pyrite, chalcopyrite, galena, and zinc blend. The deposits are referred to magmatic waters, perhaps emanating from a granitic mass a few miles west. The time of deposition is placed after metamorphism. In view of Emmons' recent work in Maine and Tennessee the evidence on this last point needs to be more carefully worked out.

A. D. B.

The Iron Ore Supply of Japan. By KINOSUKE INOUYE. "The Iron Ore Resources of the World." Stockholm, 1910. Pp. 927–69; Plates 4; Figs. 13.

The iron ore deposits of Japan are classified in six groups as follows:

I. Magmatic segregations in granite. Not of economic importance under present conditions.

II. Bedded deposits usually in connection with radiolarian quartzites and slates of Paleozoic and Mesozoic age. The ores carry from 20 to 50 per cent iron with silica up to 40 per cent. They are usually rather high in phosphorus.

III. Contact deposits in limestone near contact with intrusives. These are the most important ores of Japan. The ore is chiefly magnetite with minor amounts of micaceous hematite and limonite. The iron content averages from 55 to 60 per cent with some analyses giving over 69 per cent. The ores are mixed with contact minerals and quartz and in some cases contain pyrite and chalcopyrite.

IV. Veins in various kinds of rocks. Not of great importance under present conditions.

V. Limonite deposits derived from the decomposition and redeposition of pyrite or magnetite deposits or by deposition from ferruginous springs. These are next in importance to class III.

VI. Alluvial deposits of iron sand derived from the decomposition of older rocks.

The amount of ore in sight is estimated at 19,000,000 metric tons;